April 8, 1941. G. M. KWITEK 2,237,759

PAPER WINDING MACHINE

Filed Jan. 25, 1940 5 Sheets-Sheet 1

Fig. 1.

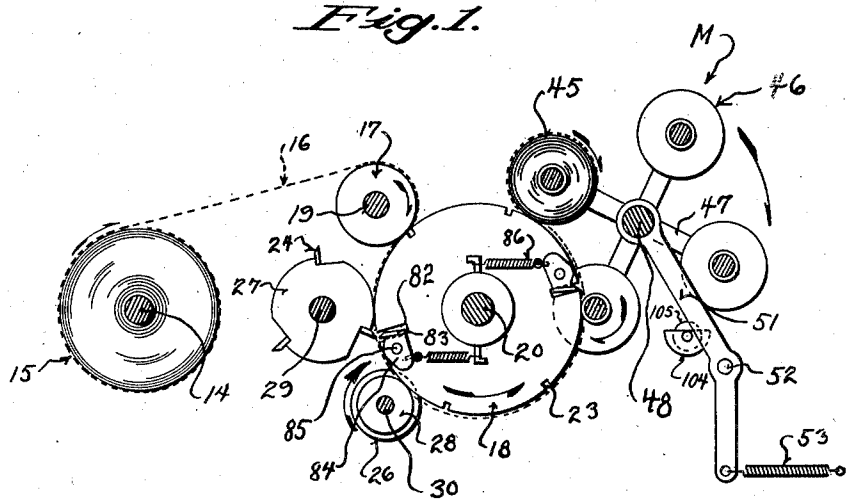


Fig. 7.

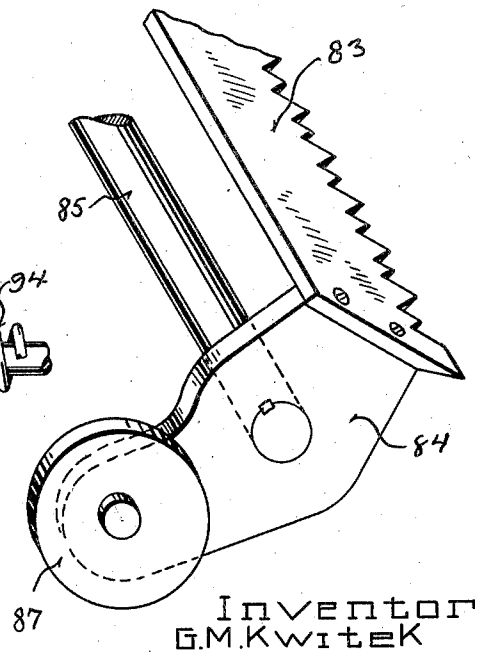
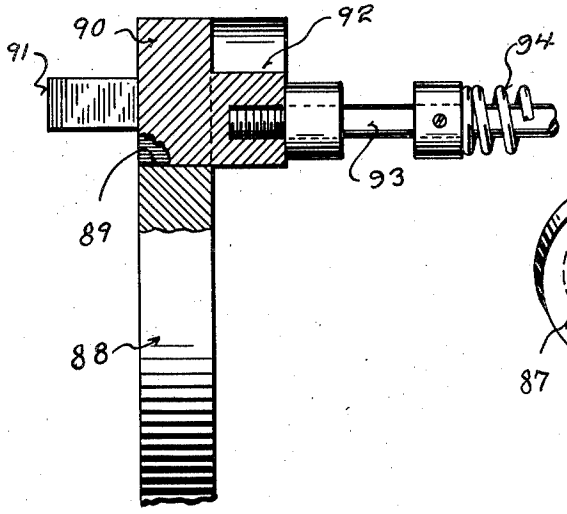


Fig. 6.



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PAPER WINDING MACHINE

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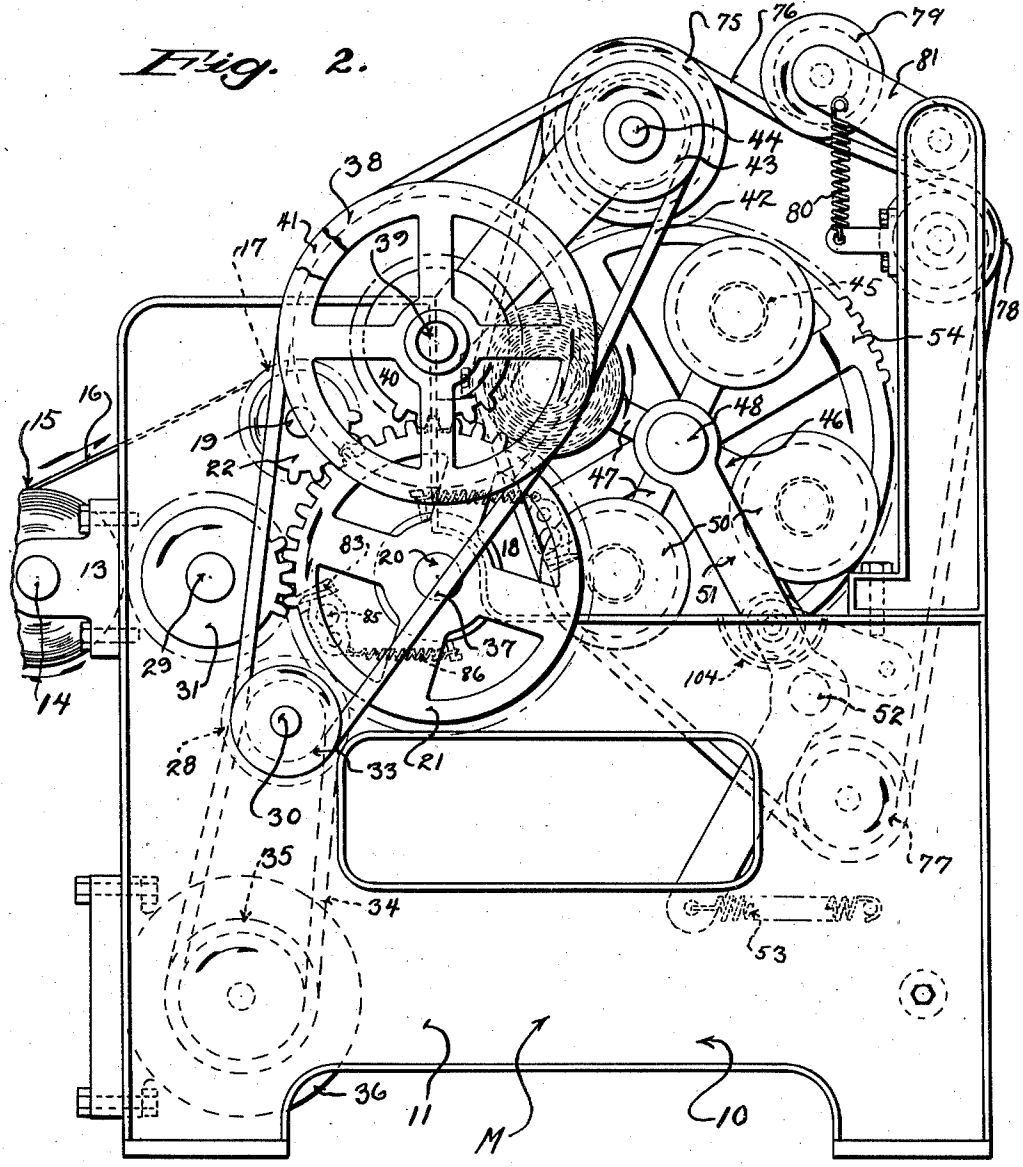
Fig. 2.



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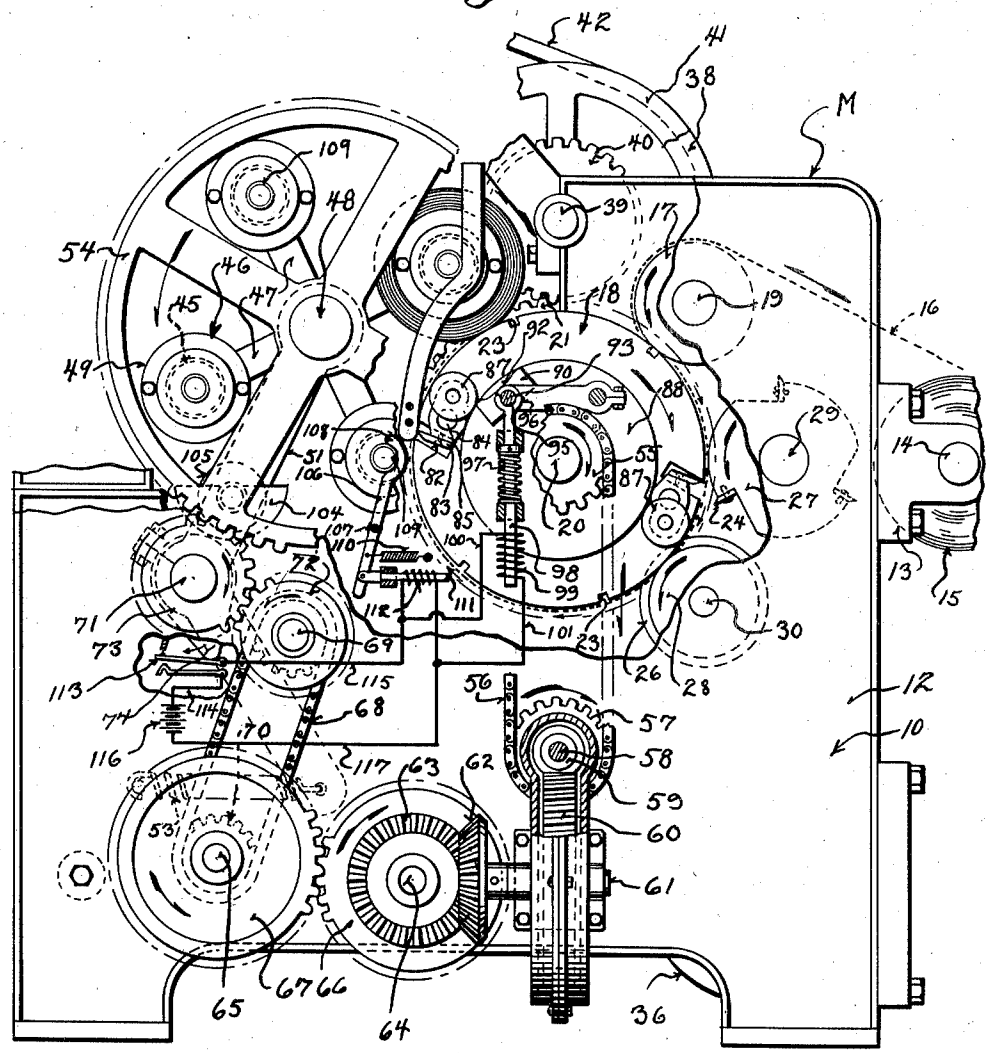
PAPER WINDING MACHINE

Filed Jan. 25, 1940 5 Sheets-Sheet 3

Fig. 3.



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PAPER WINDING MACHINE

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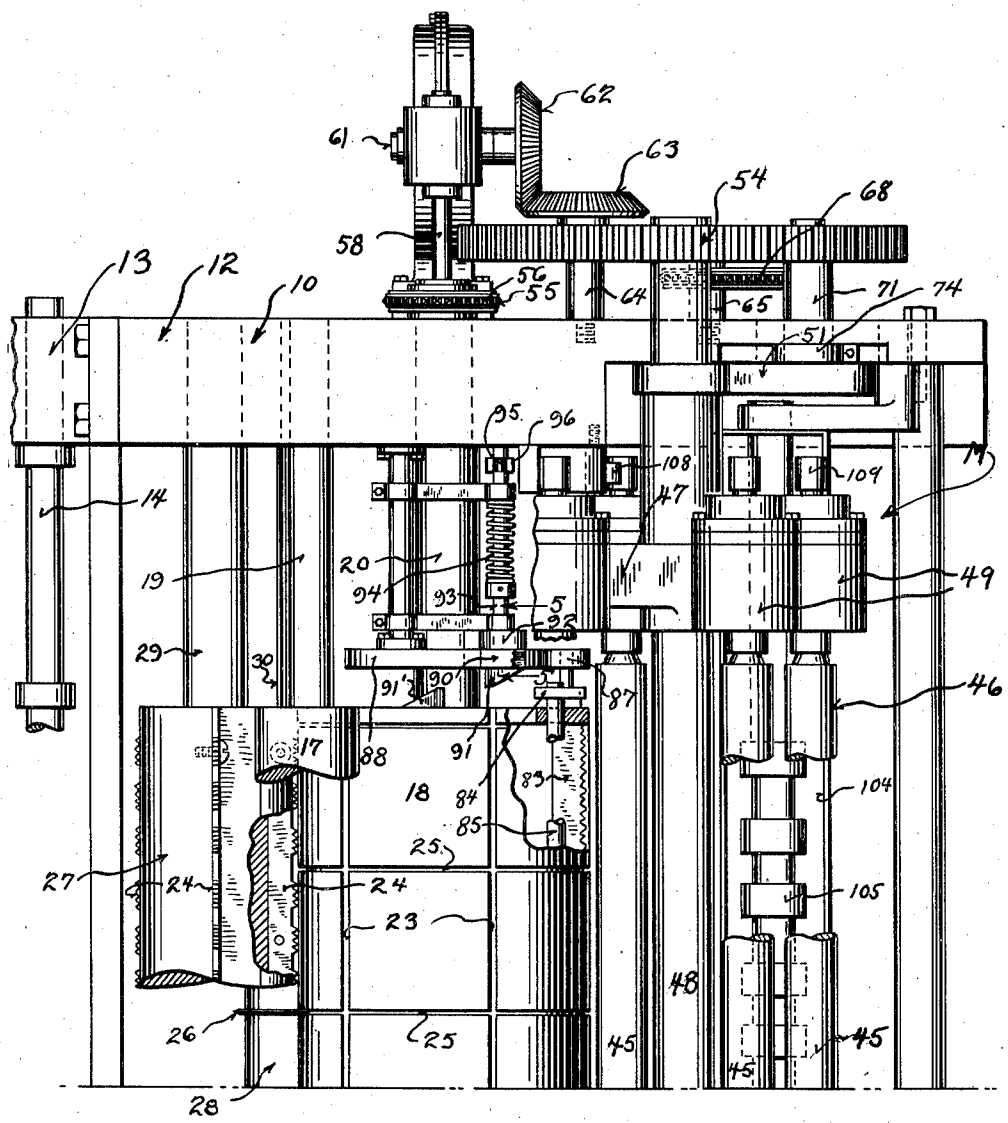
Fig. 4.



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PAPER WINDING MACHINE

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Fig. 8.

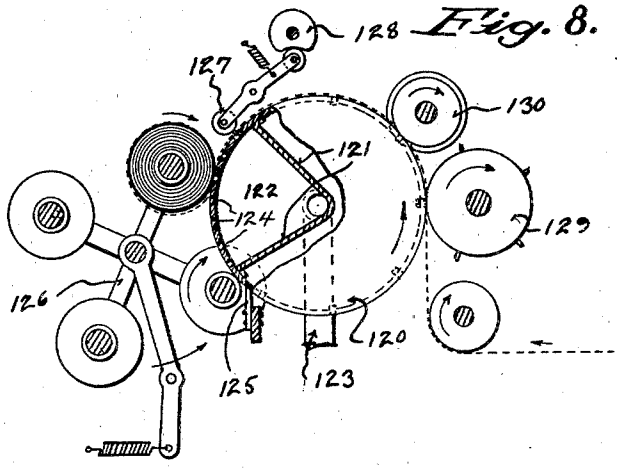
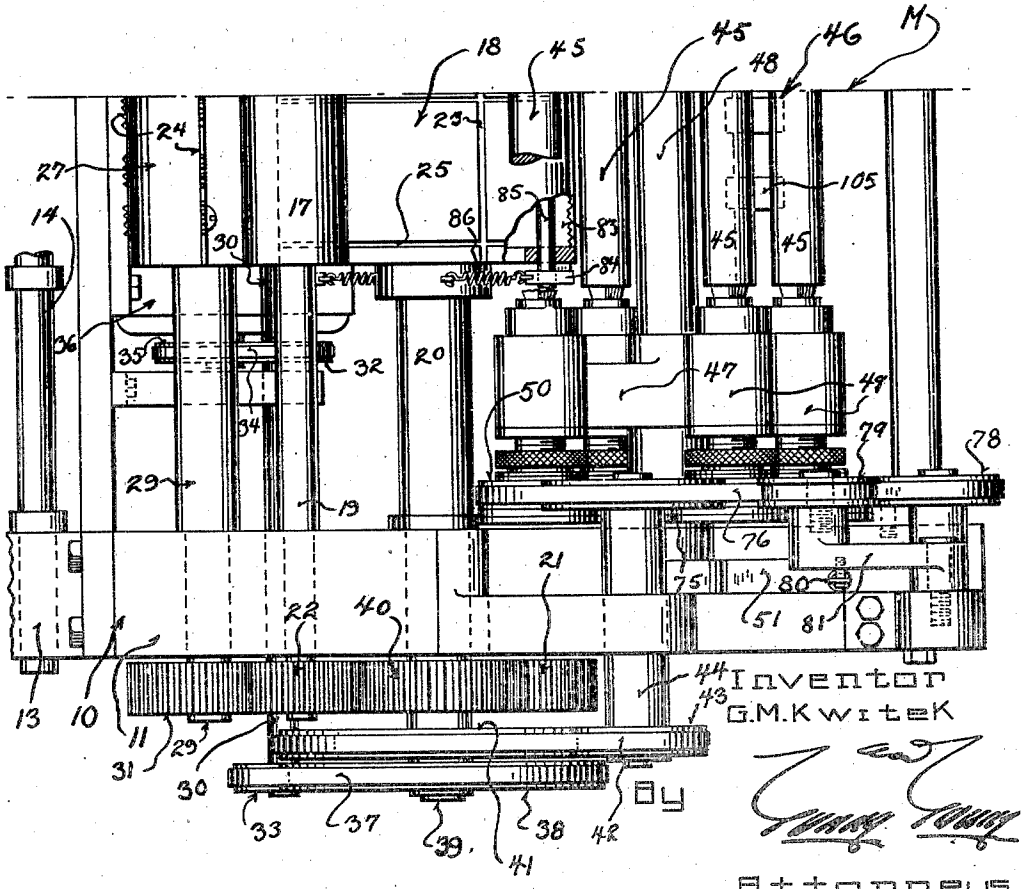


Fig. 5.



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Patented Apr. 8, 1941 2,237,759

UNITED STATES PATENT OFFICE

2,237,759

PAPER WINDING MACHINE

George M. Kwitek, Green Bay, Wis., assignor of one-half to Edwin M. Kwitek and one-fourth to Reuben J. Pech, both of Green Bay, Wis.

Application January 25, 1940, Serial No. 315,490

16 Claims. (Cl. 164—68)

This invention appertains to paper converting machinery, and more particularly to a novel continuous wind machine for re-winding a paper web from a parent roll onto suitable cores for use by the trade.

It is customary, as shown in the Letters Patent to Straubel No. 1,452,228, issued April 17, 1923, and Schueler No. 2,029,446, issued February 4, 1936, to feed a web of paper off a parent or mill roll of paper and to slit and perforate the web and to re-wind the web onto cardboard or other cores or hubs incident to the making of rolls of paper towels, rolls of toilet paper, etc.

Such machines include a slowly rotating turret or spider carrying a plurality of freely rotatable mandrils for the cores or hubs, with means for rotating a certain mandril rapidly as the same reaches a predetermined position for receiving and winding the paper web thereon. Upon the filling of the cores with the paper the rotatable turret or spider carries the filled cores out of operative position and brings a new unfilled core on a new mandril into operative position for receiving the slit and perforated web.

It is one of the primary objects of my invention to rapidly and efficiently sever the slit and perforated web adjacent the mandril, after the mandril reaches a certain position and the cores carried thereby have received the desired amount of paper thereon, so that the loaded or filled cores can be quickly removed from the machine and the unfilled cores placed on the machine and brought into proper position for receiving the paper web.

Another salient object of my invention is the provision of novel means carried directly by the bed roll for cutting the slit and perforated web, whereby to eliminate all exterior knives and to insure the carrying of the end of the web away from the bed roll, whereby the end of the paper web on the filled cores will not adhere or stick to the bed roll.

A further important object of my invention is the provision of means for automatically operating the bed roll carried knives so that the slit and perforated web will be severed at the desired and proper time.

A still further object of my invention is the provision of means for applying an adhesive to the unfilled cores as the same move toward the bed roll and to hold the adhesive-coated cores away from the bed roll until the web has been severed, whereby to permit the effective connection of the severed web with the new cores as the filled cores move away from the bed roll.

A still further important object of my invention is to provide a novel release for the mandril carrying the unfilled cores being brought into proper position, so that the mandril carrying such cores will be brought quickly into engagement with the web and bed roll with a striking action, whereby to insure the proper sticking of the severed web end to the cores.

With these and other objects in view, the invention consists in the novel construction, arrangement, and formation of parts, as will be hereinafter more specifically described, claimed, and illustrated in the accompanying drawings, in which drawings:

Figure 1 is a diagrammatic view illustrating the severing knives incorporated with the bed roll and showing the position of the various rolls and the mandril turret relative to one another.

Figure 2 is a side elevational view of my improved paper re-winding machine.

Figure 3 is a view similar to Figure 2, but looking in the opposite direction, parts of this view being shown broken away and in section to illustrate structural details.

Figure 4 is a fragmentary, top, plan view of the improved machine, illustrating the righthand side thereof.

Figure 5 is a fragmentary, top, plan view of the machine, showing the lefthand side thereof.

Figure 6 is an enlarged, fragmentary, detail, sectional view illustrating a part of the release mechanism for the paper web severing knife.

Figure 7 is an enlarged, detail, fragmentary, perspective view showing one end of the paper web-severing knife.

Figure 8 is a diagrammatic view illustrating a slightly modified form of my invention and showing a suction means for holding the slit and perforated web onto the bed roll.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter M generally indicates my paper re-winding machine, and the same includes a frame 10 having spaced parallel side pieces 11 and 12, which can be connected together and braced in any desired manner. The front of the machine carries suitable bearings 13 rigidly connected with the side pieces 11 and 12 for rotatably supporting the shaft 14 carrying the parent or mill roll of paper 15.

The paper web 16 is drawn off the parent roll by means of a pull or feed roll 17, and the paper web is trained over the feed roll and under and around the bed roll 18. The feed roll 17 is mounted upon a feed roll shaft 19, while the bed roll 18 is mounted upon a bed roll shaft 20. These shafts 19 and 20 are journaled in suitable bearings carried by the side frame pieces 11 and 12. One end of the bed roll shaft 20 has keyed or otherwise secured thereto a relatively large gear wheel 21, and secured to the feed roll shaft 19 is a pinion 22, which meshes with the gear 21.

The bed roll 18 is provided at equidistantly spaced points with longitudinally extending slots

23 for the perforating blades 24. The bed roll is further provided with a plurality of annular, equidistantly spaced grooves 25 for the reception of the paper web slitting knives 26. The perforating knives 24 are rigidly secured to a perforating roll 27, while the slitting knives 26 are rigidly carried by a slitting roll 28. These rolls are mounted, respectively, on shafts 29 and 30, which are, in turn, journaled in the side frame plates 11 and 12. The perforating roll 27 is driven in proper timed relation to the bed roll 18 by a pinion 31 keyed or otherwise secured to the perforating roll shaft 29, which meshes with the bed roll gear 21. The slitting roll shaft 30 has keyed or otherwise secured thereto at spaced points pulley wheels 32 and 33. The pulley wheel 32 has trained thereabout a pulley belt 34, which is driven from a pulley 35 keyed or otherwise secured to the armature shaft of an electric drive motor 36. The pulley 33 has trained thereabout a pulley belt 37, which drives the relatively large pulley wheel 38 keyed or otherwise secured to a countershaft 39 rotatably mounted in suitable bearings carried by the side frame pieces 11 and 12. This countershaft 39, in turn, has keyed thereto a drive pinion 40, which meshes with and drives the bed roll gear 21. The shaft 39 has further secured thereto a drive pulley wheel 41, around which is trained a pulley belt 42, which drives a pulley wheel 43 keyed or otherwise secured to the drive shaft 44 of the driving mechanism for rapidly rotating one of the mandrils 45 carried by the rotatable mandril turret 46.

The rotatable mandril turret 46 includes end spiders 47 rigidly secured to a shaft 48 arranged in spaced parallel relation to the bed roll 18. The arms of the spider 47 carry sockets or chucks 49 for detachably receiving the mandrils 45. The chucks and sockets are rotatably mounted on the end spiders, and the same carry drive pulley wheels 50.

The shaft 48 for the spiders is also rotatably mounted, so as to permit the turning of the spiders, as heretofore intimated, and, as illustrated, the ends of the shaft 48 are rotatably received in bearings carried by the upper ends of bell crank-shaped arms or levers 51. These bell crank levers 51 are rockably mounted at their angle on stub shafts 52, and contractile coil springs 53 are connected to the lower ends of the bell crank levers and the side pieces 11 of the frame of the machine. Thus, the springs 53 normally tend to rock the bell crank levers 51 and move the entire spindle or mandril turret toward the bed roll 18.

Means is provided for slowly rotating the mandril turret so that the proper mandril will be brought into operative position relative to the bed roll during the rapid rotation of the desired mandril. The means for slowly rotating the mandril turret consists of a relatively large gear wheel 54, which is driven through a train of gearing and other devices from the shaft 20 of the bed roll 18. This shaft 20 has keyed or otherwise secured thereto a sprocket wheel 55 around which is trained a sprocket chain 56. This sprocket chain 56 drives a sprocket wheel 57 keyed or otherwise secured to a countershaft 58.

The countershaft 58 has rigidly secured thereto a worm 59, which drives a worm wheel 60. The worm wheel 60 is of a relatively large diameter and is keyed or otherwise fastened to a shaft 61 arranged at right angles to the shaft 20 of the bed roll. The shaft 61, in turn, drives through the medium of intermeshing beveled gears 62 and 63 a stub shaft 64, and the stub shaft 64 drives a similar stub shaft 65 through intermeshing spur gears 66 and 67. A sprocket chain 68 operatively connects the shaft 65 with an upper stub shaft 69, and the sprocket chain 68 is trained over sprocket wheels 70 secured to said shafts. The shaft 69 is operatively connected to a spaced stub shaft 71 for driving the same through the medium of intermeshing spur gears 72 and 73. The spur gear 73 is connected with the large gear 54 and turns the same. The various drive appliances described constitute a speed reduction mechanism, so as to bring about the slow turning of the mandril turret.

While I have described and illustrated a certain drive mechanism for operating the turret, it is to be understood that equivalent mechanism can be substituted therefor. At this time it is also to be noted that the stub shaft 71 has keyed or otherwise secured thereto a wiper cam 74, the purpose of which will be later set forth.

As heretofore intimated, certain of the mandrils are rapidly rotated as the same slowly move into operative position relative to the bed roll 18, and the means for rapidly rotating the desired mandrils includes the pulley wheels 50 heretofore mentioned. Rigidly secured to the top drive shaft 44 in spaced relation to the drive pulley wheel 43 is a relatively large drive pulley wheel 75, and this pulley wheel has trained thereabout a drive pulley belt 76. The pulley belt 76 also extends over spaced idle pulley wheels 77 and 78. A belt tightener or slack take-up pulley 79 also engages the belt and is normally urged inwardly toward the belt by contractile coil springs 80. It is understood that the pulley 79 is mounted on swinging arms 81.

The pulley wheels 50 are all in the same vertical plane and are adapted to be moved into driving contact with one run of the drive belt 76 in succession during the rotation of the mandril spider. As shown in Figure 2, two of the pulleys 50 are in driving contact with the belt 76, and, thus, these two mandrils are being rapidly rotated. The topmost mandril being rotated is provided with the filled cores, while the lowermost mandril being rotated is provided with the empty cores or hubs for the reception of the paper web, and the paper web between the driven mandrils is ready to be severed. The other two mandrils of the turret are idle, and, hence, these mandrils can be removed to permit the expeditious placing of empty cores in place and the removal of the filled cores.

The means for severing the web forms one of the salient and important features of my invention, and this means will now be described in detail.

The bed roll 18 has formed therein at diametrically opposed points longitudinally extending slots 82, in which are mounted the longitudinally extending paper web severing knives 83. Each of the knives 83 is rigidly secured to arms 84 mounted intermediate their ends on shafts 85. These shafts 85 are rockably mounted on the bed roll 18, so that the knives are free to swing. Normally, the knives are held in the slots 82 and within the periphery of the bed roll, and are only brought into play and beyond the bed roll when the web is to be severed.

The arms 84 on one side of the bed roll have connected thereto contractile coil springs 86, which normally tend to urge the knives outwardly. The arms 84 on the opposite side of the bed

roll 18 carry rollers 87, and these rollers ride on the periphery of a timing wheel 88. This wheel 88 is rigidly secured to the frame of the machine against movement, so that the rollers 87 will ride around the periphery thereof during rotation of the bed roll. Due to the engagement of the rollers 87 with the timing wheel 88, swinging movement of the knives is prevented under the influence of the springs 86. The periphery of the timing wheel 88 at one point is cut away, as at 89, and, obviously, when a roller 87 rides into the cut-away portion 89 of the timing wheel, the knives are free to spring outwardly to sever the web.

Normally, the cut-out portion of the cavity 89 of the timing wheel 88 is filled by a head 90, and, hence, when the head 90 is in the cavity or cut-out portion 89, the rollers 87 are prevented from springing into said cavity. The head 90 is movable parallel with the shaft 20, but at right angles to the timing wheel 88, and, hence, the head is movable into and out of the cavity. One end of the head 90 has formed thereon a shoe 91, and the other end of the head has formed thereon the wear plate 92 into which the rollers 87 are adapted to ride when the head 90 rides out of the cavity 89. The head 90 is secured to a slide shank 93 carried by the bed roll shaft 20, and the shank is normally urged by a spring 94 toward the timing wheel 88, so that when the shank has free unrestricted movement, the head will move beyond the timing wheel and permit the wear plate 92 to take its place.

The slide shank 93 is provided at a point intermediate its ends with a reduced portion 95 defining shoulders, which are adapted to be engaged by a releasable trigger yoke 96. This trigger yoke 96 is normally urged toward the shaft 93 by an expansion coil spring 97, and, hence, the shank 93 is normally held against movement with the head 90 in the cavity 89 of the timing wheel.

The trigger has formed thereon the core 98 of an electric solenoid 99, and the coil of the solenoid has its opposite terminals connected to wires 100 and 101. At the present moment, it is to be noted that upon the energizing of the solenoid the trigger yoke will be drawn away from the shank 93, allowing movement of the head 90 under the influence of its spring 94. In order to reset the head 90 and the shank 93 after the release thereof by the trigger yoke 96, a re-set cam 91' is carried by the bed roll 18. As the re-set cam 91' rides past the cam shoe 91 the inclined surfaces of the re-set shoe 91 and cam 91' will force the head 90 back to its normal position. At this time, the trigger yoke 96 can move into engagement with the shoulders of the groove 95 to hold the head 90 and the shank 93 against movement.

As the web is severed by a knife 83, the knife moving outwardly beyond the bed roll 18 carries the free end of the severed web away from the roll, and, hence, all danger of the freshly severed end adhering to the bed roll by static electricity is eliminated.

It is also important to provide means for insuring the proper connection of the end of the web with the new unfilled cores which are being brought into active position at this time.

The means for insuring the proper connection of the new unfilled cores with the end of the web passing under the bed roll forms another salient feature of my invention, and this means includes a glue pot or reservoir 104 for receiving a suitable adhesive. Rotatably mounted in the reservoir or pot is an adhesive roll 105, which is partly immersed in the adhesive in the reservoir or pot. As the mandrils carrying the unfilled cores move past the glue pot or reservoir, the cores frictionally contact the glue roll 105, and, hence, the glue roll coats the outer surface of the cores with a desired amount of adhesive.

As the mandrils with the new unfilled adhesive-coated cores approach the bed roll, the same are held away from the periphery of the bed roll until the desired time by the use of releasable arms 106. These arms are rockably mounted intermediate their ends on pivot pins 107, and the upper ends of the arms carry yokes 108, which engage anti-friction rollers 109 carried by the ends of the mandril chucks or sockets. Contractile coil springs 110 engage the lower ends of the arms, and, hence, normally tend to move the mandrils carrying the unfilled cores away from the bed roll. The extreme lower ends of the swinging or rocking arms 106 have pivotally connected thereto a core 111 of an electric solenoid 112, and when this solenoid is energized the core is forced outwardly so as to allow the quick and rapid movement of the mandril carrying the unfilled cores into engagement with the bed roll 18 and the end of the paper web carried thereby. This is a snap trigger action and is brought about by the springs 53 of the mandril turret.

Obviously, it is necessary that the knives 83 and the swinging levers 106 be actuated in proper timed relation relative to one another and to the rotation of the mandril turret. Timing means of various characters can be utilized, and I make use of the timing or wiper cam 74 mounted upon the shaft 71 for actuating an electrically controlled timing switch 113.

The timing switch 113 includes normally spaced contact points electrically connected with electric wires 114 and 115. The wire 114 leads to one terminal of any suitable source of electrical energy, such as a battery 116, and the other terminal of the battery has electrically connected thereto a wire 117. The wires 115 and 117 lead to and are electrically connected with the terminals of the solenoid 112, and these wires also have electrically connected therewith the wires 100 and 101 of the electric solenoid 99.

From the construction so far, it can be seen that when the turret reaches a predetermined position, the switch 113 will be actuated by the timing wiper cam 74, and the closing of the switch will energize the solenoids 99 and 112. The energizing of these solenoids will bring about the actuation of one of the cutting knives 83 for severing the web and the forward movement of the mandril carrying the unfilled cores into engagement with the end of the web carried by the bed roll.

While I have shown and described electrical mechanism for controlling the actuation of the knives 83 and the mandril for the unfilled cores, it is to be understood that mechanical means can be substituted therefor, and it is contemplated by me.

From the foregoing description it can be seen that I have provided an exceptionally simple and durable means for severing the paper web from the interior of the bed roll, so that the cutting knives will carry the severed end away from the bed roll, and that I have also provided means for carrying the mandril with the unfilled cores into snap engagement with the end of the web on the bed roll upon the severing of the web, so that the end of the web carried by the bed roll can be quickly wound upon the unfilled cores.

In Figure 8, I have shown a slightly modified form of my invention, and means is illustrated diagrammatically for holding the web onto a bed roll by suction means. In Fig. 8, the bed roll is illustrated by the reference character 120, and the same can be of a hollow nature and is divided interiorly by partitions 121. The partitions 121, in conjunction with a part of the periphery of the roll, define a suction chamber 122. This suction chamber communicates through a suitable stuffing box with a suction pipe 123. The periphery of the roll 120 at spaced points has formed therein annular grooves in which ride stripper knives 125 for carrying the severed web from the bed roll to permit the severed end to be attached to unfilled cores being brought into position by the rotatable mandril turret 126. The periphery of the bed roll 120 at the suction chamber 122 is provided with suction openings 124. The paper web can be severed upon the filling of the upper cores with the desired amount of paper by means of a rock knife 127. The rock knife is actuated by a timing cam 128.

In this form of my invention, the paper web is trained over the top of the bed roll 120 past the perforating roll 129 and the slitting roll 130. When the knife 127 is actuated, the vacuum or suction can be shut off in the roll, so as to allow the release of the paper web and the finishing of the rolls of paper on the filled cores. Upon the renewal of the suction, the paper web on the bed roll will be carried by the bed roll toward the unfilled cores, and the web will be stripped from the bed roll by the stripper knives 125, heretofore mentioned. The suction can now also be cut off at this time, so as to facilitate the free movement of the web off the bed roll.

Changes in details may be made without departing from the spirit or the scope of my invention, but what I claim as new is:

1. In combination, a web feeder, a rotatable turret, mandrils rotatably mounted on the turret and adapted in revolution thereon to approach successively the path of the web, a bed roll over which the web travels, and a cutter carried directly by the bed roll for severing the web, when the mandril reaches a predetermined position relative to the bed roll and web.

2. In combination, a web feeder, a bed roll over which the web passes, a mandril movable toward and away from the web, and an automatically operated cutting knife carried by and rotatable with the bed roll and movable outwardly beyond the periphery of the bed roll for severing the web at a predetermined time.

3. In combination, a web feeder, a bed roll over which the web passes, a mandril movable toward and away from the bed roll having cores for receiving the web, a knife for severing the web carried directly by the bed roll, spring means normally urging the knife beyond the periphery of the bed roll in web-severing position, and means for preventing movement of the knife against the tension of said spring means and within the periphery of said bed roll until a stated time.

4. In combination, a web feeder, a bed roll over which the web passes, a mandril movable toward and away from the bed roll having cores for receiving the web, a knife for severing the web carried directly by the bed roll, spring means normally urging the knife beyond the periphery of the bed roll in web-severing position, and means for preventing movement of the knife against the tension of said spring means and within the periphery of said bed roll until a stated time, said means including a roller operatively associated with the knife, a timing wheel for the roller, and means for rendering the timing wheel operative at desired intervals.

5. In combination, a web feeder, a bed roll over which the web travels, a turret, means for slowly rotating the turret relative to the bed roll, mandrils rotatably mounted on the turret and adapted in revolution thereon to approach successively the path of the web, a cutter carried by the bed roll for severing the web, rockable levers mounted intermediate their ends for swinging movement carrying the cutter, spring means connected with levers normally urging the cutter to web-severing position, a timing wheel, a roller on one of the levers engaging the periphery of the timing wheel for normally holding the cutter in an inactive position against the tension of said spring means, a head forming a part of the periphery of the timing wheel movable into and out of operative position relative to the timing wheel and roller, and means for automatically operating the head at predetermined intervals relative to the rotation of the turret and bed roll.

6. In combination, a web feeder, a bed roll over which the web travels, a turret, means for slowly rotating the turret relative to the bed roll, mandrils rotatably mounted on the turret and adapted in revolution thereon to approach successively the path of the web, a cutter carried by the bed roll for severing the web, rockable levers mounted intermediate their ends for swinging movement carrying the cutter, spring means connected with levers normally urging the cutter to web-severing position, a timing wheel, a roller on one of the levers engaging the periphery of the timing wheel for normally holding the cutter in an inactive position against the tension of said spring means, a head forming a part of the periphery of the timing wheel movable into and out of operative position relative to the timing wheel and roller, and means for automatically operating the head at predetermined intervals relative to the rotation of the turret and bed roll, said means including a shank having shoulders connected to the head, spring means normally urging the shank and head in one direction, a trigger yoke normally urged into engagement with the shoulders for holding the shank and head against movement, and automatic means for actuating the trigger yoke including a solenoid, and a switch operated from a part of the turret rotating mechanism for controlling the current to the solenoid.

7. In combination, a web feeder, a turret, mandrils rotatably mounted on the turret and adapted in revolution thereon to approach successively the path of the web, a bed roll over which the web passes, means for rotating the bed roll, speed-reducing mechanism for rotating the turret from the bed roll, a drive belt operated from the bed roll, pulleys on the mandrils adapted to be brought into and out of driving contact with the belt, as the same approach and leave the path of the web, automatic means for severing the web adjacent the mandrils, and automatic releasable means for holding back an unfilled mandril from the path of the web and the bed roll until a predetermined time of release.

8. In combination, a web feeder, a bed roll over which the web travels, a turret, mandrils rotatably mounted on the turret and adapted to revolution thereon to approach successively the path of the web and bed roll, means for driving the bed roll, speed-reduction mechanism for slowly

rotating the turret from the bed roll, bell crank levers rockably mounted at their angles rotatably carrying the turret, spring means connected with the bell crank levers for normally urging the turret bodily toward the path of the web and the bed roll, means for severing the web upon the re-winding of a predetermined amount of the web on a mandril, releasable means normally holding an unfilled mandril away from the path of the web and the bed roll, and automatic means for releasing the mandril-holding means in proper timed relation relative to the turret and the bed roll.

9. In combination, a web feeder, a bed roll over which the web travels, a turret, a plurality of mandrils rotatably mounted on the turret and adapted in revolution thereon to approach successively the path of the web and the bed roll, bell crank levers rockably mounted intermediate their ends rotatably supporting the turret, means for rotating the bed roll, speed-reducing mechanism for rotating the turret from the bed roll, a web cutter, means for holding an unfilled mandril away from the path of the web and the bed roll, and means actuated in proper timed relation relative to the bed roll and the turret for actuating the cutter and the mandril-holding means to release said unfilled mandril, whereby the same can approach the path of the web.

10. In combination, a web feeder, a bed roll over which the web travels, a turret, rockable levers rotatably supporting the turret, means normally urging the levers and turret toward the path of the web and bed roll, means for rotating the bed roll, speed-reducing mechanism for rotating the turret slowly from the bed roll, means for rapidly rotating certain of the mandrils as they approach the path of the web and the bed roll, a cutter for severing the web, means for operating the cutter including a solenoid, means for preventing movement of an unfilled mandril toward the bed roll including a solenoid, a switch for controlling the operation of the solenoids, and a wiper cam rotatable in proper timed relation from the turret operating mechanism for actuating the switch.

11. In combination, a web feeder, a bed roll over which the web travels, a perforator roll and a slitting roll for the web arranged in operative relation relative to the bed roll, a turret, means for slowly rotating the turret from the bed roll, a plurality of mandrils rotatably mounted on the turret and adapted in revolution thereon to approach successively the path of the web, and means carried directly by the bed roll for severing the web passing over the bed roll between certain of the mandrils, whereby to permit the transferring of the web from the bed roll from one mentioned mandril to the other.

12. In combination, a web feeder, a bed roll, means for rotating the bed roll, a perforating roll and a slitting roll for the web arranged in operative relation to the bed roll, a turret, means for slowly rotating the turret from the bed roll, mandrils rotatably mounted on the turret and adapted in revolution thereon to approach successively the path of the web and bed roll, means for rotating a pair of the mandrils rapidly when the same are in predetermined relation relative to the bed roll, means for severing the web on the bed roll between said mandrils, whereby to effect a transfer of the web from one rapidly rotating mandril to the other rapidly rotating mandril, at the moment of the transfer one of said mandrils being wound with the web and the other being empty to receive the web.

13. In combination, a web feeder, a bed roll, means for rotating the bed roll, a perforating roll and a slitting roll for the web arranged in operative relation to the bed roll, a turret, means for slowly rotating the turret from the bed roll, mandrils rotatably mounted on the turret and adapted in revolution thereon to approach successively the path of the web and bed roll, means for rotating a pair of the mandrils rapidly when the same are in predetermined relation relative to the bed roll, means for severing the web on the bed roll between said mandrils, whereby to effect a transfer of the web from one rapidly rotating mandril to the other rapidly rotating mandril, at the moment of the transfer one of said mandrils being wound with the web and the other being empty to receive the web, means for applying an adhesive to the unfilled mandril, and automatically operated releasable means for holding the unfilled mandril away from the bed roll and the path of the web until the web has been severed.

14. In combination, a web feeder, a bed roll, means for rotating the bed roll, a perforating roll and a slitting roll for the web arranged in operative relation to the bed roll, a turret, means for slowly rotating the turret from the bed roll, mandrils rotatably mounted on the turret and adapted in revolution thereon to approach successively the path of the web and bed roll, means for rotating a pair of the mandrils rapidly when the same are in predetermined relation relative to the bed roll, means for severing the web on the bed roll between said mandrils, whereby to effect a transfer of the web from one rapidly rotating mandril to the other rapidly rotating mandril, at the moment of the transfer one of said mandrils being wound with the web and the other being empty to receive the web, means for applying an adhesive to the unfilled mandril, and automatically operated releasable means for holding the unfilled mandril away from the bed roll and the path of the web until the web has been severed, the means for severing the web including a cutter carried directly by the bed roll and movable beyond the periphery of the bed roll for carrying the severed web away from the bed roll.

15. In a paper re-winding machine, a bed roll over which the paper web passes, a web slitter and perforator for the web operating in conjunction with the bed roll, a turret, rotatable mandrils on the turret, means normally urging the turret toward the bed roll, cutter means for severing the web, and suction means for holding the web to the bed roll at certain times.

16. In a paper re-winding machine, a bed roll over which the paper web passes, a web slitter and perforator for the web operating in conjunction with the bed roll, a turret, rotatable mandrils on the turret, means normally urging the turret toward the bed roll, cutter means for severing the web, and suction means for holding the web to the bed roll at certain times, said suction means including a chamber in said roll, and a suction pipe communicating with the chamber, said roll having suction openings communicating with the chamber.

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